

Chapter 11

Media Formats for Data Submission and Archive

This standard identifies the physical media formats to be used for data submission or delivery to the PDS or its Science Nodes. It is expected that flight projects will deliver all standard digital products on magnetic or optical media. Electronic delivery of modest volumes of special science data products may be negotiated with the Science Nodes.

During archive planning, the data producer and PDS will determine the medium (or media) to use for data submission and archive. This standard lists the media that are most commonly used. Delivery of data on media other than those listed here can be negotiated with PDS on a case-by-case basis.

The use of 12-inch Write Once Read Many (WORM) disk, 8-mm EXABYTE tape or 4-mm DAT tape is NOT recommended for archival products. WORM disks are not transportable between various vendor hardware. Helical scan tape (8-mm or 4-mm) is prone to catastrophic read errors.

For archival products only media that conform to International Standards Organization (ISO) standards for physical and logical recording formats should be used.

1. The preferred data delivery medium is the compact disc, either CD-ROM or CD-WO (recordable) disc, in ISO-9660 format, using Interchange Level 1.
2. Standard computer compatible tape (CCT) on 12-inch reels recorded in ANSI format (equivalent to VAX 'COPY' format) is acceptable.
3. ISO compatible 5 1/4-inch WORM or Magneto Optical disk is acceptable.
4. IBM 3480-compatible tape cartridges are acceptable.

11.1 CD-ROM Recommendations

11.1.1 Use of Extended Attribute Records (XARs)

The use of Extended Attribute Records (XARs) on CD-ROMs shall be at the discretion of the data producer, based on the anticipated use of the CD-ROMs. If the CD-ROMs will be widely used on VMS platforms with software which expects certain record formats, then XARs should be provided. If the CD-ROMs will be used on mixed platforms and there is no existing software on the VMS platform which accesses the data files, XARs need not be included. This issue should be discussed during the Peer Review or Data Delivery Review for any CD-ROM product.

See the *Record Formats* chapter of this document for additional requirements on CD-ROMs that have XARs.

Software developed by PDS for use on VMS platforms should not expect record attributes to be specified on all CD-ROM data files, and should allow processing of files which do not have XAR records. Preferably, they should extract information about the record attributes from the PDS labels, not from the operating system.

11.1.2 Premastering Recommendation

PDS recommends that CD-ROMs be mastered using a single-session, single-track format. Other formats have been found to be incompatible with some readers.

11.1.3 Packaging Software files on a CD-ROM

If the archive is being mastered such that it will be supported on all platforms and it includes software for the MAC and SUN, then the following applies:

1. MAC Software

If the archive includes software for the MAC, the MAC files must be prepared in a particular format. This is because other platforms can't recognize the resource and data fork files that come with MAC applications. This has been done with the NIHIMAGE software on the Magellan GxDR and the Clementine EDR CD-ROMs. There is a MAC utility, called STUFFIT, that is used to prepare the files; i.e. compress and BINHEX the MAC files. The users will also need this utility in order to use the software (they will need to unBINHEX and decompress the file). This should be described in a text file included on the CD-ROM (in the appropriate SOFTWARE/DOC subdirectory).

 Example of text documenting HQX files

Macintosh Software

This directory contains software which can be used to display the GXDR images on a Macintosh II computer with an 8-bit color display.

NOTE: Because of the way this CD-ROM was produced, it was not possible to record this display program as a Macintosh executable file. Anyone who is unfamiliar with the Macintosh STUFFIT utility should contact the PDS operator, 818-306-6026, SPAN address JPLPDS::PDS_OPERATOR, INTERNET address PDS_OPERATOR@JPLPDS.JPL.NASA.GOV

The file IMAGE.HQX contains the NIH Image program, along with several ancillary files and documentation in Microsoft WORD format. It was written by Wayne Rasband of the National Institutes of Health. The program can be used to display any of the image files on the GXDR CD-ROM disks.

The Image executable and manual are stored in BINHEX format, and the utility STUFFIT or UNSTUFFIT must be used to: 1) decode the BINHEX

file IMAGE.HQX into IMAGE.SIT, using the 'DECODE BINHEX FILE...' option in the Other menu; and 2) use 'OPEN ARCHIVE' from the File menu to extract Image 1.40 from the STUFFIT archive file. There are also several other files in the archive file which should be unstuffed and kept together in the same folder as the Image executable is stored.

The STUFFIT software is distributed as shareware. STUFFIT, Version 1.5.1, is available by contacting:

Raymond Lau	MacNET:RayLau	Usenet:raylau@dasys1.UUCP
100-04 70 Ave.	GENie:RayLau	
Forest Hills, N.Y. 11375-5133	CIS:76174,2617	
United States of America.	Delphi:RaymondLau	

Alternatively, STUFFIT CLASSIC, Version 1.6, is available by contacting:

Aladdin Systems, Inc.
Deer Park Center
Suite 23A-171
Aptos, CA 95003
United States of America

2. SUN Software - preserving the SUN filesystem (e.g. filenames)

The ISO standard is all files and directories are uppercase, so when a disc is premastered as an ISO CD, this is automatically done by the premastering software. We know from experience that some CD readers connected to SUNs can show files/directories as uppercase instead of lowercase. This can cause problems when the user copies the files over and tries to do a build if the software filename should be lowercase.

There are two options on how to preserve the SUN filesystem (other than not doing anything and just documenting it). The first option was used for Clementine.

The options are:

- a. Build tar/compressed/encoded files for the SUN executables and source files. This is analogous to what is done for the MAC with the HQX files. This way the actual software filenames will be retained as they should be for the SUN when the user copies over the files and decodes/ uncompresses/detars them. This should be documented.
- b. YoungMinds provides something to deal with this very problem. A translation table can be created (called YMTRANS.TBL) to provide a mapping of the filename on the CD to what it should be on the SUN UNIX. If the premastering is on a PC, this can't be done automatically because the files have already been moved to a PC. However, it is only an ASCII table with a simple format so it can be created manually. There would have to be a translation table in every SUNOS subdirectory (/BIN, /SOURCE, /DOC) and its contents should only be of the files that appear in the subdirectory in which it exists. Software must be provided on the CD (provided by YoungMinds) for the user to copy the files. This software uses the translation tables. This would also have to be documented. As an alternative to the Young Minds solution, one could supply a custom script with the CD that will perform the proper case translations.